RecyClass for Beginners

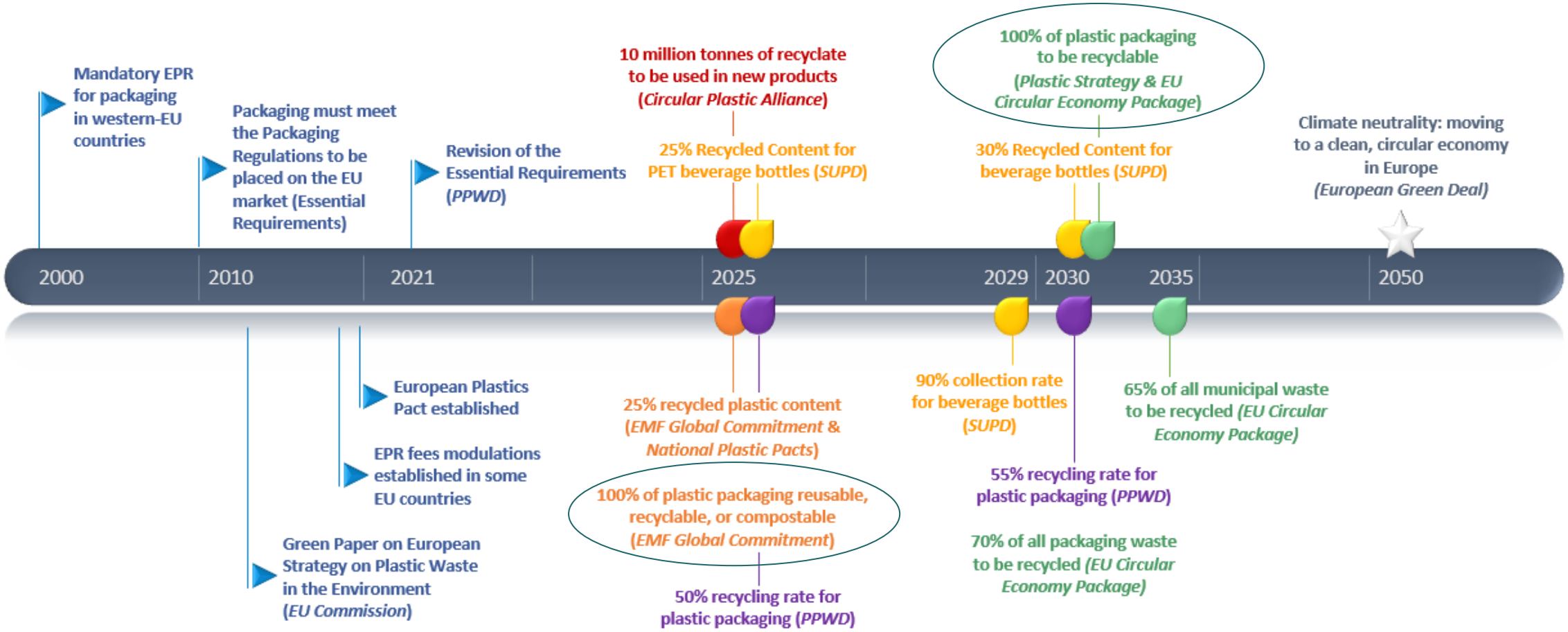
RecyClass Methodology – Recyclability 101

1 June 2022

NeXT GeN EU

RecyClass

RecyClass | HOW TO MEASURE CIRCULARITY?



Multiple commitments and legislative targets to achieve

RecyClass

Assessing recyclability of plastic packaging with a methodology that is:

- standardized (pan-European)
- comprehensive (considering also the quality of recyclates & their application in the economy)
- scientific-based (based on data)

INTRODUCTION

Traditionally, plastic packaging has been designed with functionality and marketing display in mind, while its end-of-life management has been disregarded. Today, moving forward in the transition towards circular economy, design for recycling stands as an essential measure to accomplish circular life for plastics and contributes towards diverting plastics away from landfills and incineration plants, ultimately contributing to achieve higher recycling targets while saving natural resources. The overarching goal of RecyClass is to enable high-quality recycling of plastic packaging.

RecyClass is an initiative aiming to create a value chain community around plastic packaging recyclability to find the correct way to approach and evaluate design for recycling of plastic packaging products, with the goal of improving their recyclability.

The RecyClass Platform aims at filling the existing gap between different industry actors and works towards combining the technical knowledge of polymer suppliers, converters, brand owners, waste managers and recyclers. The RecyClass Platform gathers members across the whole plastics value chain with recyclability in the core of their strategy to work on the development of testing Protocols[1], as well as on Design for Recycling Guidelines[2].

In order to create a level playing field around recycling claims, RecyClass defines two different Recyclability Assessments:

▶ DESIGN-FOR-RECYCLING ASSESSMENT

The package is designed to be recyclable, following the RecyClass Design for Recycling Guidelines. This Assessment evaluates and ranks the recyclability of a plastic packaging, determining to which extent it is suitable for a specific recycling stream based on the most commonly used sorting and recycling technologies available in Europe. This assessment does not consider collection, sorting and recycling specificities in a given country. The Assessment is based on RecyClass Design for Recycling Guidelines and its associated self-assessment tool[3], which allows to classify the technical recyclability of a plastic packaging on the EU market.

▶ RECYCLABILITY RATE ASSESSMENT

The package is designed to be recycled, following the RecyClass Design for Recycling Guidelines, and is effectively recycled in the specific geographical area for which the assessment is conducted. In this assessment, the existence of selective collection schemes, as well as the existence of sorting and recycling infrastructures are being checked.

Both Assessments are the basis for the RecyClass Certification scheme which evaluates a package qualitatively with the Design-for-Recycling Certification; and quantitatively with the Recyclability Rate Certification. The methodology behind these assessment processes is laid down in this document.

Source: https://recyclass.eu/recyclability/methodology/

Why is a methodology needed?

What is the RecyClass Recyclability Methodology?

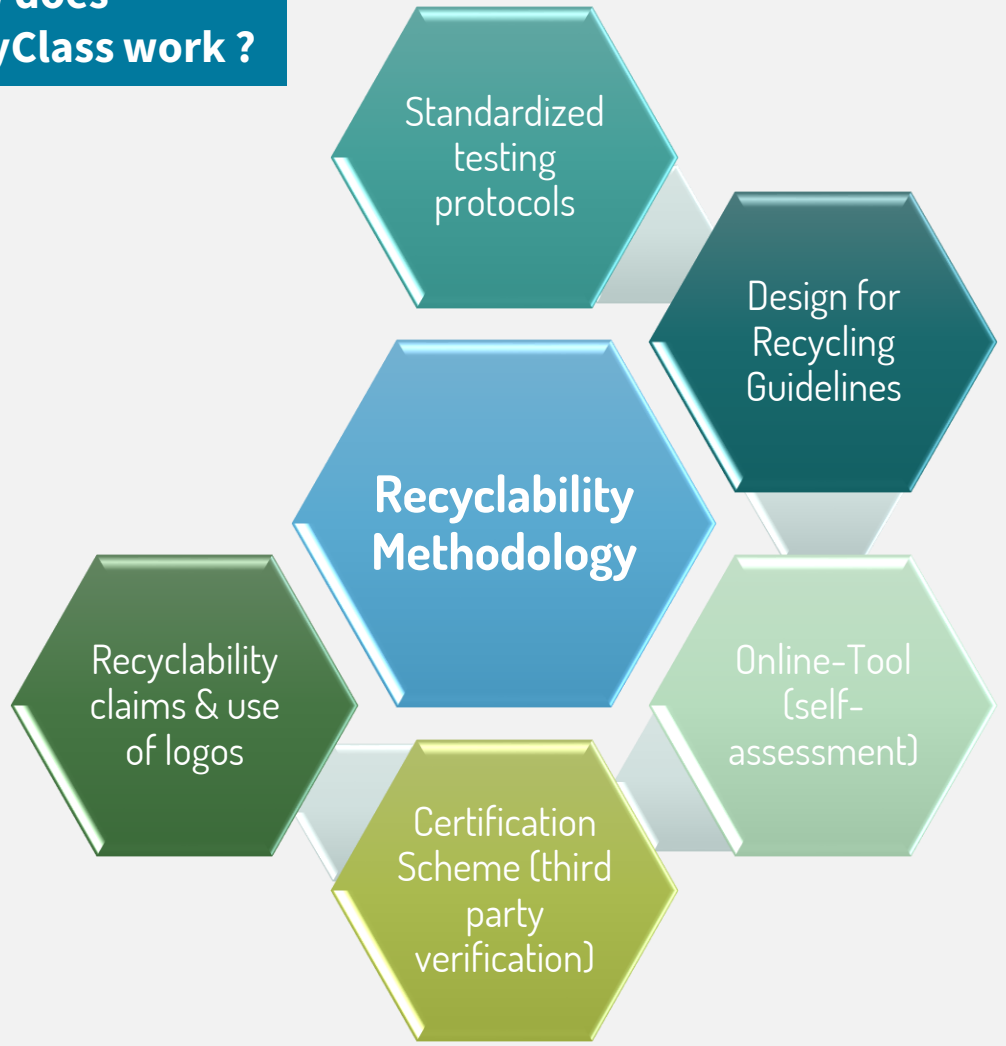
Who developed this Methodology?

What are the scope and the targets of the RecyClass Methodology?

RecyClass | METHODOLOGY: THE CENTRAL PIECE

- ✓ Different methodologies – even if based on the same guidelines – will lead to different **results & interpretations.**
- ✓ Need to **fully understand the methodology** associated with recyclability evaluation (scope, criteria, data inputs, requirements, limitations, etc.).
- ✓ The methodology **determines the recyclability assessment and the relative claims.**
- ✓ **Fact based, publicly available** DfR guidelines and methodology are therefore preferred.

How does RecyClass work ?



RecyClass | A BIT OF HISTORY

May 2014

First RecyClass **DfR Guidelines** & launch of the **Online Tool**

Feb 2020

First draft of the RecyClass Recyclability Methodology

June 2020

Release of the **Recyclability Methodology** v.1

Sept 2020

Launch of the **Recyclability Certification Scheme**

June 2021

Release of new recyclability logos & **Claims Guidance**

Dec 2021

Revision of Recyclability Methodology v.2

May 2022

>**1000 certified** packaging with the RecyClass Methodology

The RecyClass Methodology is fully connected with other resources

RecyClass | VALUE CHAIN COLLABORATION

BRANDS & RETAILERS

P&G
DANONE ONE PLANET. ONE HEALTH
Unilever
ALDI
gsk
LAVAZZA
L'ORÉAL
Mondelēz International
AVON
essity
PEPSICO
COLGATE-PALMOLIVE
kao
Henkel
FERRERO
Orkla
SCHWARZ
Edgewell PERSONAL CARE
reckitt
ISDIN

CONVERTERS

Constantia Flexibles
Berry
amcor
Sealed Air
greiner packaging
NEOPAC THE TUBE
Milliken
Taghleef Industries
saes coated films Advanced coatings for sustainable solutions
LUMSON Cosmetic Packaging Industries
ALBÉA packaging and more
Huhtamaki
深圳市通产丽星科技集团有限公司 SHENZHEN BEAUTY STAR CO., LTD
SILGAN DISPENSING
epl LEADING THE PACK
IPV PACK
DI MAURO flexible packaging
Fuji Seal
IMPERIAL Polythene
Trioworld
Bisio progetti a Guala Group company
Gualapack
Guala dispensing a Guala Group company
BEWI for a better everyday
SACMI ENDLESS INNOVATION SINCE 1919
ATE ΠΛΑΣΤ

RAW MATERIAL PRODUCERS

Bostik smart adhesives
UPMRAFLATAC
coim
AVERY DENNISON
KURZ
SunChemical a member of the DIC group
BOREALIS Keep Discovering
SIEGWERK
ExxonMobil
kuraray
All4Labels GLOBAL PACKAGING GROUP
mcc VERSTRAETE
UBE
Dow
CCL
FEDRIGONI SELF-ADHESIVES
MITSUBISHI CHEMICAL
CLARIANT
Aptargroup
KRATON
BASF We create chemistry
YUPO

SUPPORTERS

epro European Association Of Plastics Recycling & Recovery Organisations
Styrenics Circular Solutions
petcore EUROPE
Grønt Punkt Norge
FEICA
EuPIA
FINAT Linking the Label Community
EUMEPS
AGMPM
natureef
NTCP national test centre circular plastics
Searious BUSINESS
HPRC Healthcare Plastics Recycling Council

RecyClass | OUR KEY DRIVERS

RecyClass vision

- Making **plastic circular** by ensuring all products are **recyclable** and by promoting transparent uptake of recycled content in new products **in line with the circular economy**

Methodology scope

- Assessment of plastic packaging circularity (high design requirements) supporting companies to **claim their products circular**, independently of the current recyclate end-markets

RecyClass Commitments

- **Reflecting reality**: based on the most commonly used sorting & recycling infrastructures in Europe
- **Reliable & transparent**: based on standardized lab tests and data

***Circularity**: endorsement of the EMF definition & listed as mandatory requirement of the recyclability definition (jointly developed with APR – USA)*

Source: https://recyclass.eu/recyclability/definition/

THE METHODOLOGY IN PRACTICE

- ✓ Recyclability is not binary
- ✓ RecyClass developed a **class ranking from A to F** reflecting impacts on the recycling process and on the recyclate quality
- ✓ Classes **A to C are in line with the circular economy** and recyclability can be claimed
- ✓ Classes D to F are attributed to packaging with **major design issues** (e.g., leading to sorting or recycling losses, downcycling, incineration)

RECYCLABILITY CLASSES

CLASS A
The packaging does not pose any recyclability issues and the recycled plastics can potentially feed a closed-loop scheme to be used in the same quality application.

CLASS B
The packaging has some minor recyclability issues that slightly affect the quality of the recycled plastic generated. However, majority of recycled plastics from this packaging can still potentially feed a closed loop.

CLASS C
The packaging presents some recyclability issues that affect the quality of the recycled plastics or lead to material losses during recycling. In the first case the recycled plastic could be used in a cascade open-loop scheme, whereas in the latter case the plastic could potentially feed a closed loop scheme.

CLASS D
The packaging has significant design issues that highly affect its recyclability or imply large material losses. In both cases the recycled plastic can only be fed into low-value applications (i.e. the packaging will be downcycled).

CLASS E
The packaging has major design issues that jeopardize its recyclability or imply severe material losses. The packaging is not considered recyclable and can only be used in incineration with energy recovery.

CLASS F
The package is not recyclable at all, either because of fundamental design issues or a lack of specific infrastructure for collection, sorting and recycling in EU28+2.

RecyClass | THE METHODOLOGY IN PRACTICE

RECYCLABILITY DEFINITION :

Packaging **collected** for recycling (established collection system)

Packaging **sorted & aggregated into defined mono-stream** for recycling processes.

Packaging **can be processed & reclaimed/recycled** with commercial recycling processes.

The recycled plastic becomes a raw material that **is used in the production of new valuable products.**

ASSSESSMENT CRITERIA :

1. Waste management systems (collection, sorting and recycling) & Sortability (Sorting Protocol)
2. Recyclable Plastic Content (valuable & recoverable materials)
3. Design incompatibilities (DfR Guidelines)
4. Easy-to-Empty / Easy-to-Access Index
5. REACH compliance

RecyClass | THE METHODOLOGY IN PRACTICE

Concepts around ***recyclability*** to keep in mind

Design for Recycling

- ✓ Technical feasibility of being correctly sorted and recycled ('recyclable')
- ✓ Packaging design compatible with the current waste management infrastructures in Europe

Recycled

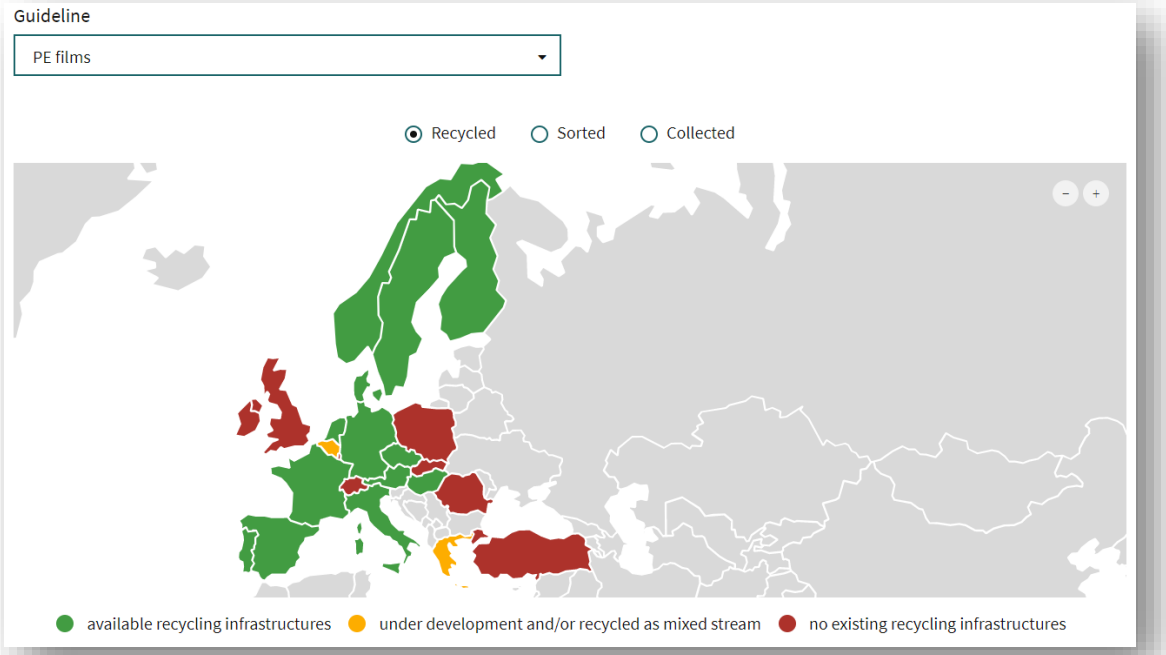
- ✓ Collection, sorting & recycling infrastructures established in the given geographical area or country ('recyclability in practice')
- ✓ End-markets available for the recyclate

RecyClass | WASTE MANAGEMENT SYSTEMS

- PET bottles (except opaque)
- Clear PET trays
- HDPE containers & tubes
- PP containers & tubes
- EPS fish boxes
- PE films
- PP films
- PS containers
- Crates and Pallets
- EPS white goods

PRE maps the existing recycling streams.

RecyClass develops the corresponding Design for Recycling Guidelines and offers a European mapping of the established waste management systems *(cf: RecyClass free Online Tool)*

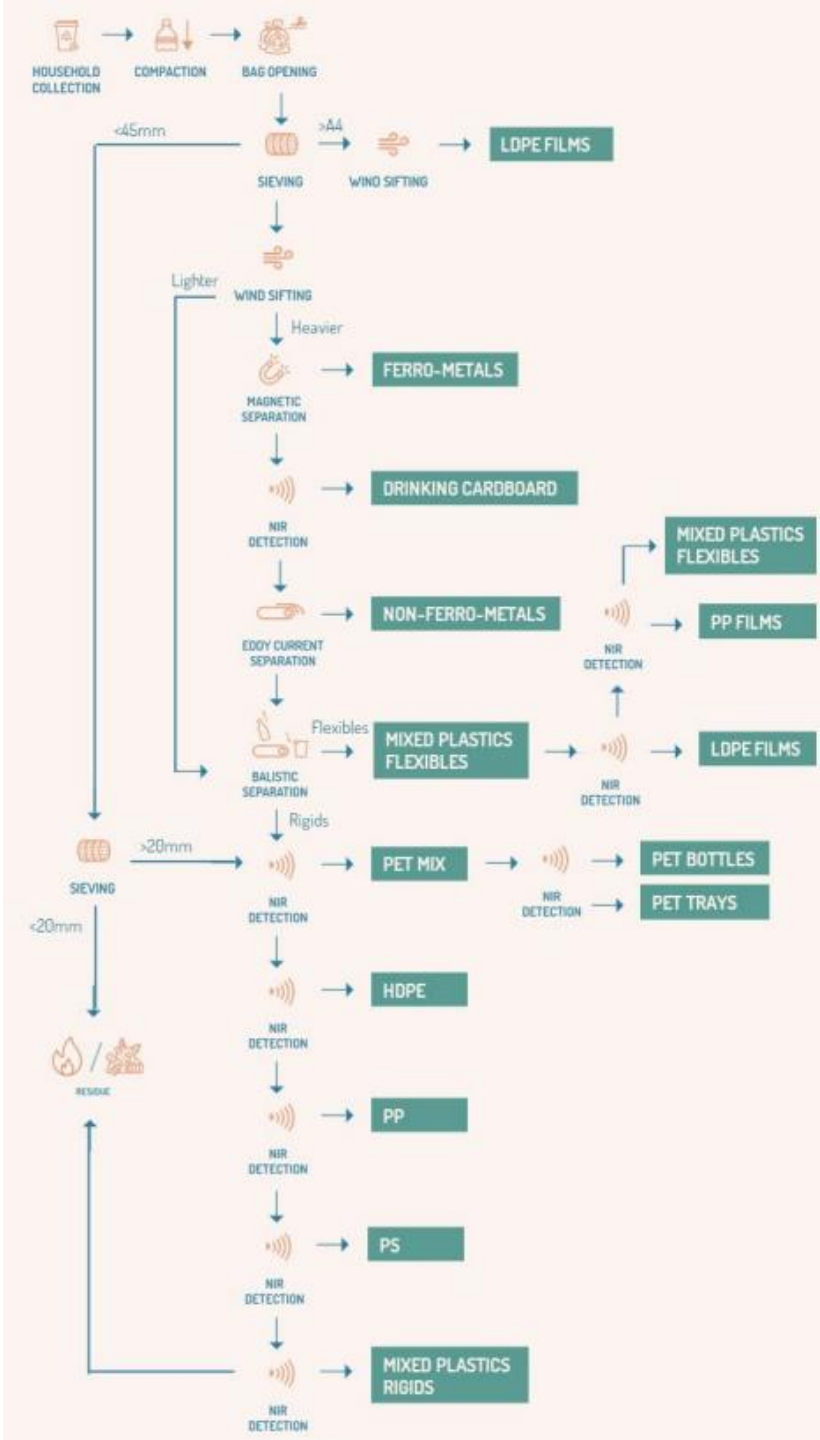


RecyClass | SORTABILITY

The sorting behavior must be assessed, as several features may prevent the sortability of the packaging. The Sorting Protocol must be applied in the following cases:

- Large labels (covering > 50% of non-detectable surface) made from a different polymer
- Full body sleeves
- Perforated full body sleeves
- Multi-layer structures (excluding PE/PP EVOH)
- Metallization (excluding on the inside/in the middle layer)
- Non NIR detectable colors (also when dark colors used for internal layers)
- Different types of plastic used on front and back sides
- Different types of plastic (rigids and flexibles) used in the package
- Round shape, very rigid and hard to compact

Penalties must be applied according to the sorting effiency.

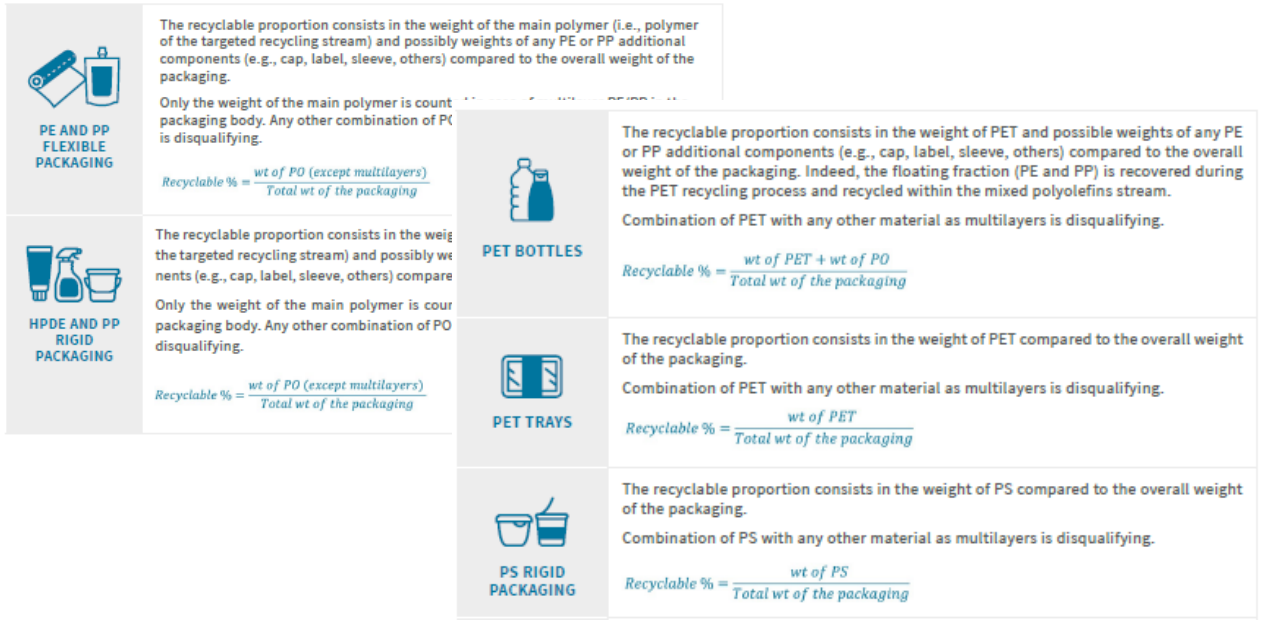


RecyClass | RECYCLABLE PLASTIC CONTENT

- Weight of barriers, coatings, mineral fillers, labels/sleeves, adhesives, printing inks, as well as any other components have to be considered.

Mono-material packaging is preferred

- The higher the content of one polymer in the packaging, the higher its recyclability rate is (i.e. the quantity and quality of plastic effectively recycled).



Class A if > 95%

Class B if 90-95%

Class C if 70-90%

Non-recyclable < 70%

RecyClass | DfR INCOMPATIBILITIES

FULL COMPATIBILITY

Green column gathers the preferred design features, that guarantee the best recyclability and quality of the recyclate.

LIMITED COMPATIBILITY

Yellow column lists the second choices for each packaging features, that have been tested, known, or supposed to slightly impact the recycling and/or the quality of the recyclate.

LOW COMPATIBILITY

Red column classifies the detrimental and disqualifying features that should be avoided when designing a packaging, as strongly impacting the recycling and/or the quality of the recyclate.

RecyClass — **Natural PE Flexible Films for Household and Commercial Packaging**

		YES - FULL COMPATIBILITY	CONDITIONAL - LIMITED COMPATIBILITY	NO - LOW COMPATIBILITY
	MATERIAL COMPOSITION (AMOUNT OF PE & PP ATTACHMENTS IN THE PACKAGING)	A > 95%, B > 90% and all packaging features are FULLY compatible with recycling	C > 70% and all packaging features are FULLY compatible with recycling	D > 50%, E > 30%, F < 30% and all packaging features are FULLY compatible with recycling
	DESCRIPTION (TEST PROTOCOL)	Materials that passed the testing protocols with no negative impact OR materials that have not been tested (yet), but are known to be acceptable in PE recycling	Materials that passed the testing protocols if certain conditions are met OR materials that have not been tested (yet), but pose a low risk of interfering with PE recycling	Materials that failed the testing protocols OR materials that have not been tested (yet), but pose a high risk of interfering with PE recycling
	DESCRIPTION (METHODOLOGY)	In case of at least one limited compatibility one penalty is applied, lowering the recyclability class from A to B or from B to C	In case of at least one limited compatibility one penalty is applied, lowering the recyclability class from C to D	In case of at least one limited compatibility one penalty is applied, lowering the recyclability class from D to E or from E to F
MAIN BODY	MATERIAL*	PE-LD, PE-LLD; PE-HD	Multilayer PE/PP with PP < 5%	Multilayer PE/PP with PP > 5%; Any other polymer (e.g. PET, PVC, etc.)
MAIN BODY	COLOURS	Unpigmented; transparent	Light colours; translucent colours	Dark colours; black; carbon black
MAIN BODY	SIZE	> A4 or > 50 x 50 mm once compacted	< A4 format or between 20 x 20 and 50 x 50 mm once compacted (Sorting test)	< 20 x 20 mm
MAIN BODY	PRODUCT RESIDUES (EASY TO EMPTY INDEX)	A if the index is < 5%; B if the index is < 10%	C if the index is < 15%	D if the index is < 20%; E < if the index is < 25%; F if the index is > 25%
MAIN BODY	BARRIER	Barrier in the polymer matrix; SiOx and AlOx without additional coatings	< 5% EVOH (in polyolefinic combination film); metallized layers without coatings; EcoLam High Plus; VO+ LLDPE; <15% PA 6/66 copolymer with melting temperature < 192 °C and incorporating > 10% PE-g-MAH tie layers	> 5% EVOH (in polyolefinic combination film) Any other PA; foaming agents used as expanding chemical agents; aluminium
MAIN BODY	ADDITIVES	Additives that do not increase the density higher than 0,97 g/cm³		Additives that do increase the density higher than 0,97 g/cm³ (CaCO3, talc, glass fibers, etc.)
ATTACHMENTS	CLOSURE SYSTEM	PE-LD, PE-LLD, PE-HD	PP	Metal, aluminium, PVC, PET, PETG, PS, PLA, non PO or foams with density < 1 g/cm³
ATTACHMENTS	LINERS, SEALS AND VALVES	PE-LD, PE-LLD, PE-HD	PP, removable aluminium liddings	Metal, aluminium, PVC, PET, PETG, PS, PLA, foiled paper, non PO or foams with density < 1 g/cm³
ATTACHMENTS	OTHER COMPONENTS	PE-LD, PE-LLD, PE-HD	PP	Metal, aluminium, PVC, PET, PETG, PS, PLA, paper, foams with density < 1 g/cm³
DECORATION	INKS	Non-toxic (according to EUPIA guidelines)		Inks that bleed; Toxic or hazardous inks
DECORATION	LABELS	PE	PP, paper labels without fiberloss	Metallized labels, any other; paper labels with fibreloss
DECORATION	ADHESIVES FOR LABELS	Water soluble or water-releasable at less than 60°C		Adhesives non soluble in water or non-releasable in water at less than 60°C
DECORATION	DIRECT PRINTING	Laser marked print; Printed production or expiry date	ng < 50%**	> 50% **

RECYCLED CONTENT: No change in the recyclability assessment. A sep… Certification' based on a Chain of Custody approach is available with RecyClass

* Polymer resin can be either fossil- or bio-based, virgin or recycled.
** Temporary solution

-1 class

-3 classes

Disqualified

Last update: June 2021

RecyClass | 2-STEPS APPROACH ILLUSTRATION

Example: PE clear pouch

COMPOSITION

- PE POUCH 95,6%
- PE WHITE CAP 4,4%

ADDITIONAL INFORMATION

- MULTILAYER PE WITH 4% EVOH BARRIER
- DIRECT PRINTING WITH CLEAR COLOUR 3%
- < 50% PRINTING COVERING
- NO LABEL OR OTHER ATTACHMENTS

I - Recyclable plastic content

PE share (valuable material) between 90 and 95 wt%	**Interim class: B**

II - Design incompatibilities

The DfR guideline for PE films classifies EVOH < 5% as limited compatible	**Interim class: C**

Focus on 2 criteria to illustrate the impact of packaging composition (assuming that previous criteria - as sortability - were fulfilled). Other examples are available on the RecyClass Methodology document.

RecyClass | EASY-TO-EMPTY EASY-TO-ACCESS INDEX

- Presence of a residual product content in packaging affects negatively its recyclability; a packaging which is designed to be emptied easily is more recyclable than the one retaining significant quantities of the product.

- For a package that contains liquids, creams, gels or pasty products the easy-to-empty / easy-to-access index must be calculated.

CALCULATION METHOD

$$Ete_i = \left(\frac{Pe - W}{Pf}\right) x\ 100$$

W *= weight of a fully empty packaging (without product inside)*
Pf *= declared net weight of content (in case of volume it must be converted in weight)*
Pe *= average weight of empty packaging after normal use, in minimum 10 emptying tests.*

RESULTS:

- ✓ More than 5% = -1 class
- ✓ More than 10% = -2 classes
- ✓ Further loss of a class with each increase of 5% in the calculated index

PRACTICE WITH THE RECYCLASS ONLINE TOOL!

- **Ranks the recyclability of plastic packaging based on RecyClass Methodology**
- Evaluates packaging recyclability given the existing recycling streams
- Gives precise indications on critical points to be improved
- Provides European mapping of the waste management systems

RecyClass | GET CERTIFIED!

DESIGN FOR RECYCLING ASSESSMENT

- Qualitative Assessment: **ranking from A to F**
- Valid for the **EU market**
- Based on the **European plastic waste streams**
- Packaging design, sorting behaviour, end-markets included

RECYCLABILITY RATE ASSESSMENT

+ 90%

- Quantitative Assessment: **% of recyclable content, in addition to class ranking**
- **Country-specific**
- Based on the **local collection and availability of infrastructures**
- Packaging design, sorting behaviour, end-markets included

Detailed information online

RecyClass | TO KEEP IN MIND

RecyClass Methodology is setting **high requirements** that the plastic industry need to **reach the European targets and regulations** (e.g., on recycled content)

By setting high requirements, RecyClass Methodologies goes **beyond the current regulations & national legislations** to be a frontrunner and **drive circularity**

RecyClass Methodology is a **comprehensive assessment** taking into consideration the entire waste management system and the quality of the recyclate

Any kind of plastic packaging can be assessed with the RecyClass Methodology and certified through a **third-party audit**

RecyClass
FOR BEGINNERS

Questions & Answers

Use the Q&A box in the top-right corner of your screen

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RecyClass
FOR BEGINNERS

Thank you for participating!

Save the dates!

21 September

12 October

14 December

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